Geologists' tools in space

EOSDIS data show local and regional patterns of geologic structures, rock outcrops, soils, and sediments.

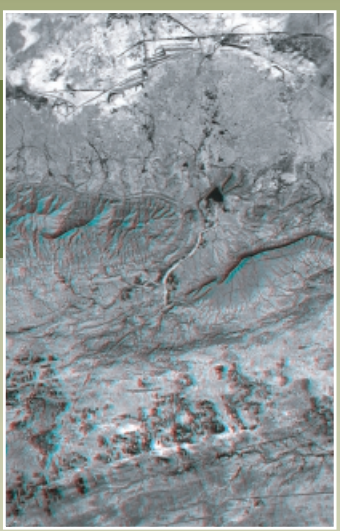
Terra MODIS image gives a synoptic view of a remote part of the Sahara Desert along the southern border between Algeria and Libya.

Image courtesy of Luca Pietranera, Telespazio, Rome, Italy

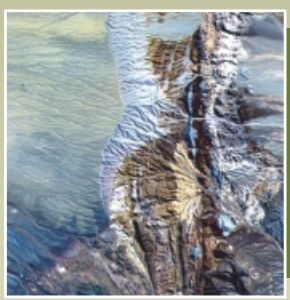
Image annotation after Seeber et al., 2001

Landsat 7 ETM+ color and anaglyph images show geologic structures of India's Katch region.

Images courtesy of Landsat Science Team

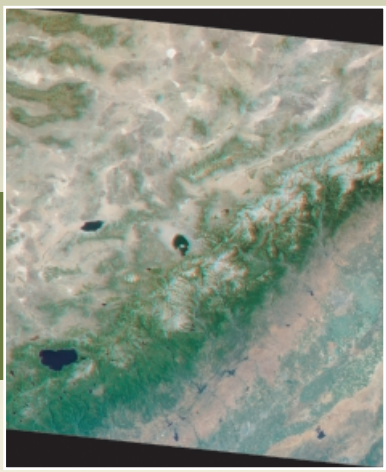


Red–blue glasses required to view 3–D effects.



Terra ASTER image of the Altiplane of Chile displays a very clear view of an angular unconformity.

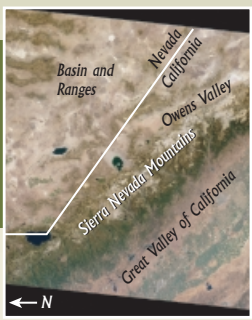
Image courtesy of NASA/GSFC/MITI/ERSDAC/JAROS, and U.S./Japan ASTER Science Team



Red–blue glasses required to view 3–D effects.

Terra MISR color and anaglyph images feature two views of the central Sierra Nevada Mountains.

Images courtesy of NASA/GSFC/JPL, MISR Science Team



National Aeronautics and Space Administration

Ground truth is necessary to identify geologic elements in some images.

Nov/W013788 Rocks Poster

EOSDIS Data Distinguish Geologic Features

Scientific data products from NASA's Earth Observing System (EOS) satellites allow observation and analysis of environmental changes. The images featured on this poster represent only a small sample of the many EOS Data and Information System (EOSDIS) products useful in studying geologic structures in remote areas.

Three-band composite images show local and regional patterns of rock outcrops, soils, and sediments. Different minerals in the rocks produce the different colors seen in the images. Additional computer processing can enhance subtle color differences and produce images in perspective and stereo views. (Note that red-blue glasses allow the viewer to see the anaglyph images on this poster in three dimensions.) Composite and processed images allow geologists to map local and regional geology, locate mineral resources, and detect and monitor geologic hazards.

Terra MODIS – Moderate-Resolution Imaging Spectroradiometer

The natural color image gives a synoptic view (an area covered by ± 16 Landsat scenes) of the Sahara Desert along the southern border between Algeria and Libya. It shows Precambrian plutonic and Paleozoic sandstone outcrops, along with modern sand seas (ergs), and Pleistocene lake deposits and river canyons. The Tassil N'Ajjer National Park of Algeria (left half of image) is famous for its geology, fauna, and ancient cave paintings.

Image courtesy of Luca Pietranera, Telespazio, Rome, Italy
Reference: http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=4900
Scene ID: SC:MOD021KM.001:810996. Data acquired August 25, 2000
Data Set: MODIS/TERRA CALIBRATED RADIANCES 5-MIN L1B SWATH 1KM V001

Terra ASTER – Advanced Spaceborne Thermal Emission and Reflection Radiometer

The subset image shows a very clear view of an angular unconformity of the Altiplano (Atacama Desert) of Chile. The unconformity is between flat-lying pyroclastic rocks of the Altiplano-Puma volcanic complex on top of inclined Cretaceous sediments. The pale yellow rocks may represent hydrothermal alteration (world's largest copper mine, at Chuquicamata, and El Tatio Geysers are in the vicinity). The geologic section is exposed by erosion from the east.

Image courtesy of the NASA/GSFC/MITI/ERSDAC/JAROS, and U.S./Japan ASTER Team
Reference: http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=4792
Scene ID: SC:AST_L1B.002:2002270252. Data acquired April 7, 2000
Data Set: ASTER LEVEL 1B DATA SET REGISTERED RADIANCE AT THE SENSOR V002

Landsat 7 ETM+ – Enhanced Thematic Mapper Plus

The true color and anaglyph images show the Haro Hills Anticline of India's Katch region. The anticline is related to crustal compression as India drifted into Asia and, perhaps, is related to the major earthquake of January 26, 2001. Also shown is a volcanic dike separating the contrasting geologic structures of Kas Hills and Haro Hills.

Image courtesy of the Landsat Science Team
Reference: http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=4821
Image Annotation: Information from report by Seeber, et al. See http://neotectonics.seismo.unr.edu/Bhuj/Report.html
Data Granule ID: SC:L70RWRS.002:2002430646. Data acquired February 9, 2001
Data Set: LANDSAT-7 LEVEL_OR WRS_SCENE DATA V002

Terra MISR – Multi-angle Imaging Spectroradiometer

True color and anaglyph [3-D red and blue lenses from AN (nadir) and BF (45.6-degree forward) cameras] images show the central Sierra Nevada Mountains with Yosemite, Sequoia, and Kings Canyon National Parks; a portion of the Great Valley of California; Owens Valley; and the basins and ranges of California and Nevada. (Note that north is to the left). Mono Lake is visible near the center of the image, with Lake Tahoe to the north and Walker Lake to the east.

Image courtesy of the NASA/GSFC/JPL, MISR Science Team
Reference: http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=4281
Data Granule ID: SC:MI1B2E.001:357288. Data acquired August 12, 2000
Data Set: MISR LEVEL 1B2 ELLIPSOID DATA V001

For information about the NASA EOS missions and instruments, see http://eos.nasa.gov/.
For information about the data centers that distribute EOSDIS data, see the DAAC Alliance Web site at http://nasadaacs.eos.nasa.gov.